injured by an excess of alkali.

It often occurs that there is a large percentage of the salts that cause alkali in the subsoil, but not enough in the surface layers to seriously affect the crop. In a case of this kind in the humid region, when we have a dry period the subsoil water rises by capillarity and carries some of the salts in solution depositing them on the surface. The same thing may occur when irrigation is practiced and too much water is used without proper cultivation. This is spoken of as the "rising of the alkali" and care should be taken to prevent it if possible.

The amount of soluble salt or alkali which will be injurious to the plant depends upon the kind. Such substances as sulphate of soda (glauber salts) are not as harmful as others, such as carbonate of soda (salsoda). Sulphate of soda and similar compounds form "white alkali" and carbonate of soda and allied compounds form "black alkali." Ordinarily plants will grow in soils containing ten times as much sulphate of soda as they will in the case of the carbonate. For this reason it is quite important to know the kind of salts which cause an alkali soil before deciding on the method for improvement. In most cases "black alkali" can be changed to the sulphate form by the use of gypsum on the land.

In most localities the first step in the improvement of alkali soils should be to provide proper drainage. Good surface drainage will accomplish this in many cases, but where it can be done, under drainage is more satisfactory. The next step is to grow some green manuring crop such as millet or field peas and plow it under. Plowing under stable manure also has a beneficial effect. If there is only a small amount, grow some cultivated crop in order to keep a mulch on the surface to prevent excessive evaporation.

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